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(54) [Title of the Invention] FILING APPARATUS

(57) [Abstract]

[Object] To save data under a file name generated with file name duplication reduced.

[Construction] A portable-type still image transmission apparatus 1 is connected to a stationary-type still image transmission apparatus 2 via a telephone line 5. A magneto-optical disk device 4 as a filing apparatus is connected to the stationary-type still image transmission apparatus 2. To save still image data, transmitted from the portable-type still image transmission apparatus 1 to the stationary-type still image transmission apparatus 2, onto the magneto-optical disk device 4, a save request is input via the keyboard 3. In response to the save request, the stationary-type still image transmission apparatus 2 acquires date and time information from an internal real-time clock unit, and generates a file name based on the date

and time information. The stationary-type still image transmission apparatus 2 saves the still image data (still image file) under the generated file name. The file name is uniquely determined by the date and time at which the file is produced, and no file duplication occurs in a single file system (disk). This arrangement eliminates time to input a file name, reduces the amount of file names to be searched for, and permits a saving operation to be quickly performed.

[Claims]

[Claim 1] A filing apparatus comprising file name generating means for generating a file name based on at least one of date information and time information, wherein data is saved under the file name generated by the file name generating means.

[Detailed Description of the Invention]

[0001]

[Technical Field of the Invention] The present invention relates to a filing apparatus for a magneto-optical disk device.

[0002]

[Description of the Related Art] Still image transmission systems for exchanging still image data between still image transmission apparatuses have been proposed. The still image transmission apparatuses include portable-types and stationary-types. A filing apparatus such as magneto-optical disk device is connected to the stationary-type still image transmission apparatus.

[0003] For example, the portable-type still image transmission apparatus transmits still image data to the stationary-type still image transmission apparatus via a telephone line, and the still image data (still image file) is saved in the filing apparatus as necessary.

[0004]

[Problems to be Solved by the Invention] A save request to the filing apparatus is input via a keyboard connected to the stationary-type still image transmission apparatus. A file name can also be entered via the keyboard.

[0005] If an input file name coincides with an existing one, the stored still image file under that file name is deleted. The input file name is thus searched for to see if there is no identical file name stored. If the same file name is present, another file name is entered again via the keyboard.

[0006] When a user enters a file name using the keyboard, file name duplication is likely to happen. If a file name is duplicated, another file name needs to be entered, and searching for that file is performed again.

[0007] If file names are duplicated, time to enter a file name is increased, and quantities of file names to be searched for are increased, and a saving operation cannot be performed quickly.

[0008] The present invention provides a filing apparatus that saves data by generating file name in smaller duplication.

[0009]

[Means for Solving the Problems] A filing apparatus of the present invention includes file name generating means for generating a file name based on at least one of date information and time information, wherein data is saved

under the file name generated by the file name generating means.

[0010]

[Operation] Since a file name is uniquely determined by date and time of file generation, the file name is not duplicated in a single file system (such as a disk). Time to enter a file name is reduced, and the quantities of file names to be searched for are reduced, and a saving operation is quickly performed.

[0011]

[Embodiments] On embodiment of the present invention is described below with reference to the drawings.

[0012] Fig. 1 illustrates the structure of a still image transmission system of the embodiment of the present invention. As shown, a portable-type still image transmission apparatus (SFU) 1 is used. Fig. 2 illustrates an operation panel of the transmission apparatus 1. The operation panel includes a power switch 11, a liquid-crystal display 12, function keys 13, and numerical keys 14.

[0013] Returning to Fig. 1, a stationary-type still image transmission apparatus (DIH) 2 is shown. There are also shown a keyboard 3 connected to the transmission apparatus 2, and a magneto-optical disk device 4 as a filing apparatus connected to the transmission apparatus 2.

[0014] The transmission apparatus 1 and the transmission

apparatus 2 are connected to each other via an analog telephone line 5 so that communications are performed to exchange still image data between the transmission apparatus 1 and the transmission apparatus 2.

[0015] Fig. 3 is a block diagram of the still image transmission system. In Fig. 3, elements identical to those described with reference to Fig. 1 are designated with the same reference numerals. Connected to the transmission apparatus 1 as shown in Fig. 3 are a video deck 1a and a video camera 1b, as video signal input devices, and a monitor 1c as an output device. Connected to the transmission apparatus 2 are a video deck 2a and a video camera 2b, as vide signal input devices, and a monitor 2c as an output device.

[0016] The portable-type still image transmission apparatus 1 has a structure of Fig. 4. As shown in Fig. 4, a system bus 102 is connected to a CPU 101. Connected to the system bus 102 are a system ROM 103 storing a process program for data decoding (data decompression process), and data encoding (data compression process), a working RAM 104 for data processing, and a real-time clock 105 outputting date and time data.

[0017] A digital signal processor (DSP) 107 is connected to the system bus 102 via a buffer RAM 106. The DSP 107 encodes still image data (in the data compression process)

and decodes still image data (in the data decompression process).

[0018] A frame memory 108 is connected to the system bus 102. The frame memory 108 is supplied with, as the still image data, a digital signal, into which an A/D converter 109 converts a video signal from one of the video deck 1a and the video camera 1b (shown in Fig. 3). The still image data, read from the frame memory 108, is converted into an analog signal by a D/A converter 110, and the resulting analog signal is supplied to the monitor 1c (of Fig. 3).

[0019] The system bus 102 is connected to the analog telephone line 5 via an internal modem 111. The system bus 102 performs communications with the transmission apparatus 2 via the internal modem 111 to exchange the still image data with the transmission apparatus 2. The transmission apparatus 1 cannot be connected to a digital line (ISDN line).

[0020] A backup RAM 112 is connected to the system bus 102. The backup RAM 112 stores parameters set at power off, and the system is initialized with the set parameters when power is back on.

[0021] The display 12 (shown in Fig. 2) is connected to the system bus 102 via a display interface 113. The display 12 displays file names and functions corresponding to the function keys 13.

[0022] Further connected to the system bus 102 is a key switch 115, containing the function keys 13 and the numerical keys 14 (shown in Fig. 2), via a key switch interface 114.

[0023] The stationary-type still image transmission apparatus 2 has a structure of Fig. 5. The transmission apparatus 2 includes a CPU 201. The CPU 201 control write operation and read operations to the magneto-optical disk device 4, controls transmission of the still image data, and communications with the transmission apparatus 1, and controls transmission of the still image data in the encoder and the decoder.

[0024] A system bus 202 connects to the CPU 201. Connected to the system bus 202 are a system ROM (EPROM) 203 storing a process program, etc., a working RAM 204 for data processing, and a real-time clock 206 outputting date and time data.

[0025] A backup RAM 205 connects to the system bus 202. The backup RAM 205 stores parameters at power off, and the set parameters are used to initialize the system at power on.

[0026] A serial controller 207 connects to the system bus 202. The keyboard 3 (shown in Fig. 1) is connected to the system bus 202 via the serial controller 207.

[0027] A SCSI controller 208 connects to the system bus 202. The magneto-optical disk device 4 is connected to the system bus 202 via the SCSI controller 208.

[0028] Further connected to the system bus 202 are an ISDN LAPD controller 209 for control channels and an ISDN LAPB controller 210 for data channels. When the system bus 202 is connected to a digital line (ISDN line), controllers 209 and 210 are used therebetween. As previously discussed, the transmission apparatus 1 cannot be connected to a digital line, but can be connected to another apparatus of the same type as the transmission apparatus 2.

[0029] The analog telephone line 5 is connected to the system bus 202 via an internal modem interface 211 and an internal modem 212. The system bus 202 communicates with the transmission apparatus 1 via the internal modem interface 211 to exchange the still image data.

[0030] A DTMF encoder/decoder 213 connects to the system bus 202.

[0031] A CPU 221 controls encoding process (data compression process) and decoding process (data decompression process) performed on the still image data, and decoding process and encoding process performed on characters and hand-written data.

[0032] A system bus 222 is connected to the CPU 221. Connected to the system bus 222 are a system ROM (EPROM) 223 storing a process program, a working RAM 224 for data processing, a Kanji level 1 ROM 225, and Kanji level 2 ROM 226.

[0033] A digital signal processor (DSP) 228 is connected to the system bus 222 via a DSP board interface 227. The DSP 228 encodes still image data (in a data compression process) and decodes still image data (in a data decompression process).

[0034] A frame memory 229 is connected to the system bus 222. The frame memory 229 is supplied with, as the still image data, a digital signal, into which an A/D converter 230 converts a video signal from one of the video deck 2a and the video camera 2b (see Fig. 3). The still image data, read from the frame memory 229, is converted into an analog signal by a D/A converter 231, and the resulting analog signal is fed to the monitor 2c (shown in Fig. 3). The DSP 228 is directly connected to the frame memory 229.

[0035] A shared RAM 241 and a two-way FIFO 242 are connected between the system bus 202 and the system bus 222. The shared RAM 241 stores data instructing the decoding process and the encoding process each time. The two-way FIFO 242 is used to exchange the still image data between the system bus 202 and the system bus 222.

[0036] In the above-referenced system, the still image data stored in the frame memory 108 in the transmission apparatus 1 is transmitted to the transmission apparatus 2 as described below.

[0037] The still image data stored in the frame memory 108

is encoded (data compressed) by the DSP 107, and then supplied to the telephone line 5 via the internal modem 111. The telephone line 5 then supplies the still image data to the internal modem 212 in the transmission apparatus 2.

[0038] The still image data from the internal modem 212 is stored first in the working RAM 204 via the internal modem interface 211 and the system bus 202. The still image data, from the working RAM 204, is supplied to the DSP 228 via the system bus 202, the two-way FIFO 242, the system bus 222, and the DSP board interface 227. The DSP 228 decodes (data decompresses) the still image data. The still image data, decoded by the DSP 228, is written onto the frame memory 229. An image resulting from the still image data is thus displayed on the monitor 2c.

[0039] The still image data is supplied from the working RAM 204 to the magneto-optical disk device 4 via the system bus 202 and the SCSI controller 208, and then saved (recorded) onto a magneto-optical disk (MO disk) as necessary.

[0040] The still image data written on the frame memory 229 in the transmission apparatus 2 is transmitted to the transmission apparatus 1 as described below.

[0041] The still image data, written on the frame memory 229, is encoded (data compressed) by the DSP 228, and then supplied to the telephone line 5 via the system bus 222, the

two-way FIFO 242, the system bus 202, the internal modem interface 211, and the internal modem 212. The still image data is then supplied to the internal modem 111 in the transmission apparatus 1 via the telephone line 5.

[0042] The still image data from the internal modem 111 is then stored in the working RAM 104 via the system bus 102. The still image data from the working RAM 104 is supplied to the DSP 107 via the system bus 102 and the buffer RAM 106 for decoding (data decompression). The still image data decoded by the DSP 107 is stored in the frame memory 108 and the still image data as an image is displayed on the monitor 1c.

[0043] The still image data recorded on the magneto-optical disk of the magneto-optical disk device 4 is transmitted to the transmission apparatus 1 as described below.

[0044] The still image data written on the magneto-optical disk of the magneto-optical disk device 4 is read and then supplied to the telephone line 5 via the SCSI controller 208, the system bus 202, the internal modem interface 211, and the internal modem 212. The still image data is then supplied to the internal modem 111 in the transmission apparatus 1 via the telephone line 5. The subsequent operation remains identical to that of transmitting the still image data written on the frame memory 229 in the transmission apparatus 2 to the transmission apparatus 1.

[0045] The still image data written on the frame memory 229 in the transmission apparatus 2 is saved (recorded) in the magneto-optical disk as described below.

[0046] The still image data written on the frame memory 229 is encoded (data compressed) by the DSP 228, and then supplied to the magneto-optical disk device 4 via the system bus 222, the two-way FIFO 242, the system bus 202, and the SCSI controller 208 and then saved in the magneto-optical disk.

[0047] The image of the still image data written on the magneto-optical disk of the magneto-optical disk device 4 is displayed on the monitor 2c as described below.

[0048] The still image data recorded on the magneto-optical disk of the magneto-optical disk device 4 is read, and then supplied to the DSP 228 for decoding (data decompression) via the SCSI controller 208, the system bus 202, the two-way FIFO 242, the system bus 222, and the DSP board interface 227. The still image data, decoded by the DSP 228, is written onto the frame memory 229. The image is thus displayed on the monitor 2c.

[0049] The transmission apparatus 2 thus automatically generates a file name when the still image data is saved onto the magneto-optical disk in response to a save request input via the keyboard 3 (shown in Fig. 3). The still image data is thus saved under the generated file name.

[0050] Fig. 6 illustrates the operation of the transmission apparatus 2 on which the save request is input via the keyboard 3.

[0051] In response to the save request input via the keyboard 3 (step 151), a file name is generated in accordance with the date and time (step 152). The still image data (still image file) is saved (recorded) onto the magneto-optical disk of the magneto-optical disk device 4 under the generated file name (step 153).

[0052] More specifically, the generation of the file name in step 152 is performed in accordance with a flowchart of Fig. 7.

[0053] The date and time information is acquired from date and time data output from the real-time clock 206 (step 161).

[0054] As shown in Fig. 8, the file name is composed of seven characters A[0]-A[6]. The seven characters A[0]-A[6] are successively determined as described below.

[0055] The least significant digit of the "year" is set as A[0] (step 162). The "month" converted In accordance with a table 1 is set as A[1] (step 163).

[0056]

[Table 1]

Number to character conversion table

Number	Character	Number	Character	Number	Character
0	0	13	D	26	Q
1	1	14	E	27	R
2	2	15	F	28	S
3	3	16	G	29	T
4	4	17	H	30	U
5	5	18	I	31	V
6	6	19	J		
7	7	20	K		
8	8	21	L		
9	9	22	M		
10	A	23	N		
11	B	24	O		
12	C	25	P		

[0057] The "day" converted in accordance with the table 1 is set as A[2] (step 164). The "time" converted in accordance with the table 1 is set as A[3] (step 165). Two digits of the "minute" are set as A[4] and A[5] (step 166), and 0 is set as A[6] (step 167). A[6] is a serial number representing the sequence order of file production at the same "minute".

[0058] The CPU 201 searches files on the magneto-optical disk according to A[0]-A[6] thus determined (step 168). In this case, the CPU 201 searches a region of a "directory entry" of the magneto-optical disk (Fig. 9 illustrates a recorded content of the magneto-optical disk). File name data is recorded on that region when the still image data is recorded onto the magneto-optical disk.

[0059] If it is determined in step 168 that the corresponding file is present, A[6] is incremented by one (step 169). The CPU 201 returns to step 168 to search a file on the magneto-optical disk according to A[0]-A[6]. If the serial number is equal to or above 10, one alphabet is selected as A[6] in accordance with the table 1.

[0060] If it is determined in step 168 that no file is present, the file name generation process ends. In other words, the character string of A[0]-A[6] is determined as a file name.

[0061] For example, if the save request from the keyboard 3 is performed 12:26 on March 23, 1991. The character string A[0]-A[6] becomes "13NC260" (with A[6] being 0). 13NC260 is thus determined as a file name.

[0062] In accordance with the embodiment, a file name is generated based on the date and time at which the save request is entered via the keyboard 3. The still image data is saved onto the magneto-optical disk under that file name.

[0063] Since the file name is uniquely determined based on the date and time, file duplication on one magneto-optical disk is unlikely, and the amount of files to be searched is reduced. The file name is automatically generated. There is no need for inputting a file name via the keyboard 3. Time to enter file names is reduced. A saving operation is thus quickly performed.

[0064] Since each of the "month", the "day", and the "time" is represented by a single alphanumerical character listed in the table 1, the number of characters representing the file name as small as seven is sufficient.

[0065] Since the algorithm for generating the file name is relatively simple, the date and time of file generation are easily learned from the file name. The files are sorted by file generation sequence order.

[0066] In accordance with the present embodiment, the file name is a seven-character string. If a file name of eight characters or more is permitted, the a terminal ID (particular character string) of the transmission apparatus 1 (terminal) receiving the still image data may be attached to the file name.

[0067] In accordance with the above-referenced embodiment, the file name is generated using the date and time information. The same advantage is still provided even if only one of the date information and the time information is used.

[0068] In the above-referenced embodiment, the filing apparatus connected to the stationary still image transmission apparatus 2 is the magneto-optical disk device 4. The present invention is applicable even if the filing apparatus is other filing apparatuses including an optical disk device, and a magnetic disk device.

[0069] In the above-referenced embodiment, the still image data is saved on an optical disk. The present invention is equally applicable to a filing apparatus that stores data other than the still image data.

[0070]

[Advantages] In accordance with the present invention, the file name is uniquely determined by date and time of file generation. The possibility of file duplication on one file system (such as a disk) is reduced. Time to enter the file is reduced. The quantity of files to be searched is reduced. The saving operation is thus quickly performed. The file name is related to the file generation date and time, and the files are sorted by file generation sequence order by viewing the file names.

[Brief Description of the Drawings]

[Fig. 1] Fig. 1 generally illustrates the still image transmission system.

[Fig. 2] Fig. 2 illustrates the operation panel of the portable-type still image transmission apparatus.

[Fig. 3] Fig. 3 is a block diagram illustrating the structure of the still image transmission system.

[Fig. 4] Fig. 4 is a block diagram illustrating the structure of the portable-type still image transmission apparatus.

[Fig. 5] Fig. 5 is a block diagram illustrating the

stationary-type still image transmission apparatus.

[Fig. 6] Fig. 6 is a flowchart illustrating the operation (saving operation) of the stationary-type still image transmission apparatus.

[Fig. 7] Fig. 7 is a flowchart illustrating the routine of generating the file name.

[Fig. 8] Fig. 8 illustrates the character string of the file name.

[Fig. 9] Fig. 9 illustrates the recorded content of the magneto-optical disk (MO disk).

[Reference Numerals]

1 portable-type still image transmission apparatus

2 stationary-type still image transmission apparatus

3 keyboard

4 magneto-optical disk

5 analog telephone line

101, 201, and 221 CPUs

104, 204, and 224 working RAMs

105 and 206 real-time clocks

107 and 228 digital signal processors

108 and 229 frame memories

111 and 212 internal modems

FIG. 1

STILL IMAGE TRANSMISSION SYSTEM

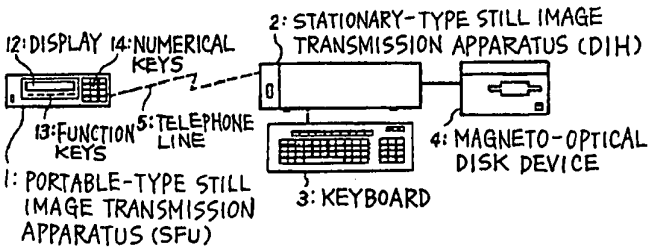


FIG. 2

OPERATION PANEL

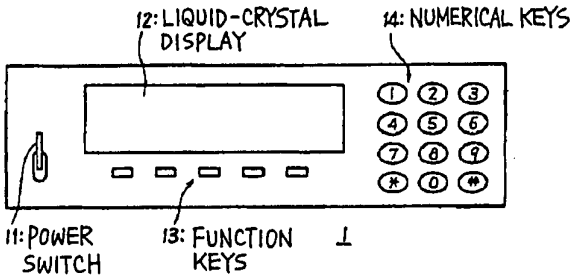


FIG. 3

STILL IMAGE TRANSMISSION SYSTEM

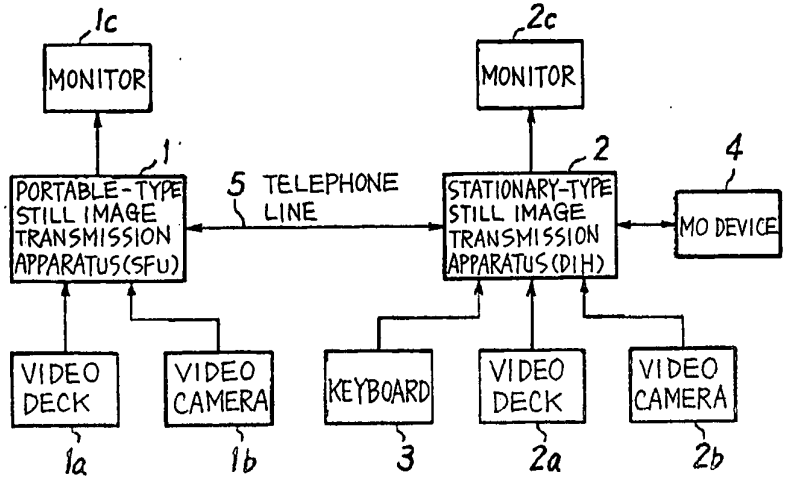


FIG. 8

CHARACTER STRING OF FILE NAME

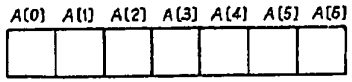
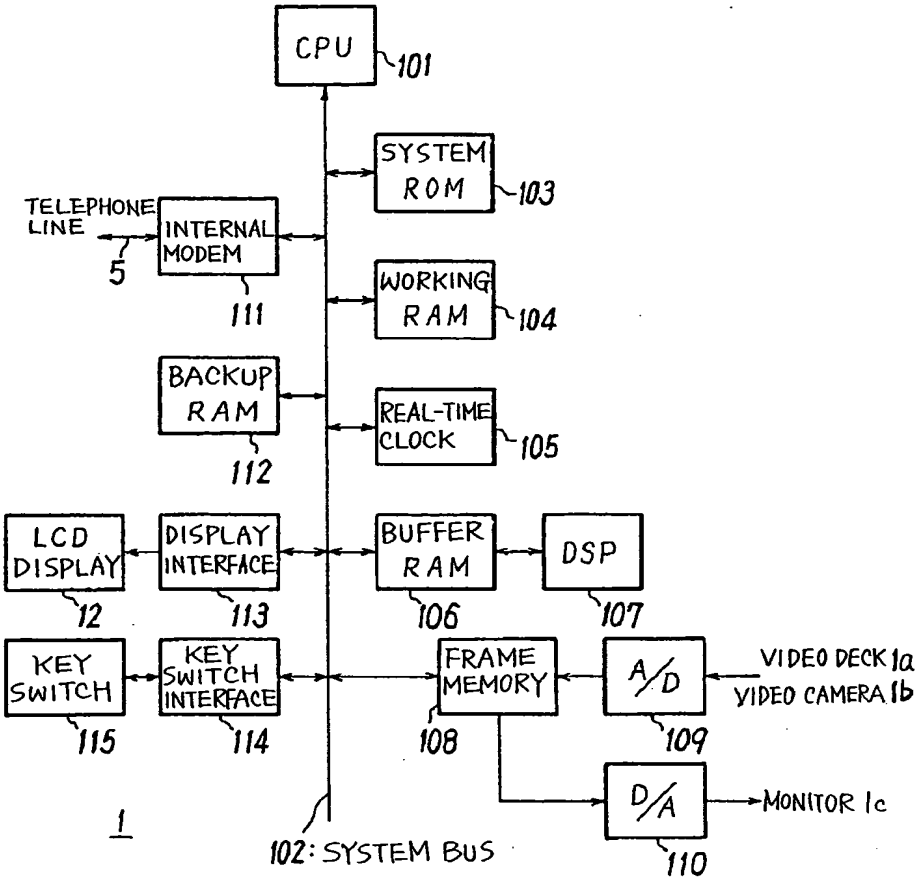


FIG. 4



PORTABLE-TYPE STILL IMAGE TRANSMISSION APPARATUS (SFU)

FIG. 9

RECORDED CONTENT OF MO DISK

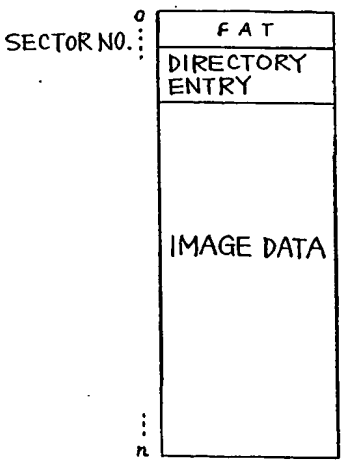
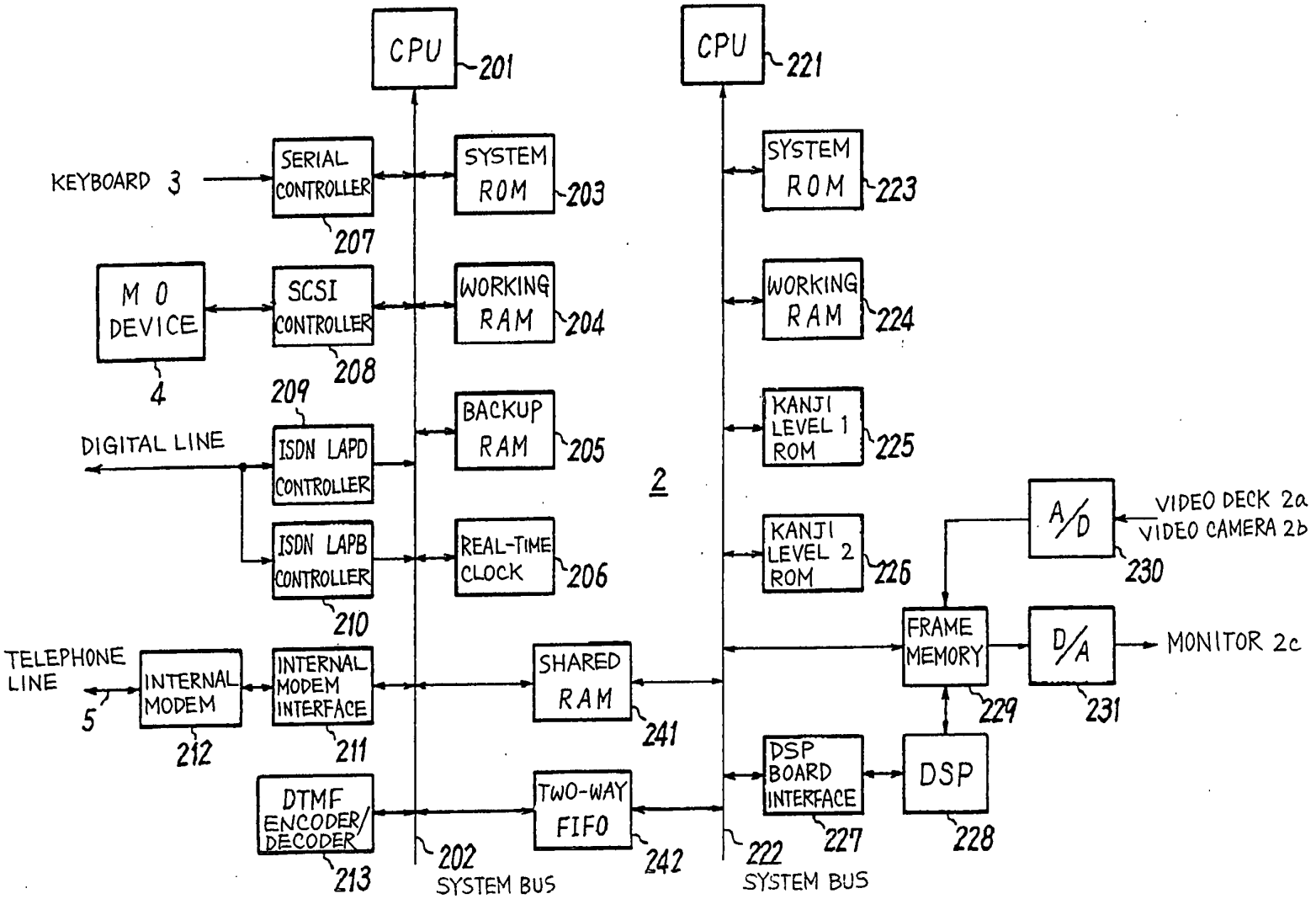


FIG. 5



STATIONARY-TYPE STILL IMAGE TRANSMISSION APPARATUS (DIH)

FIG. 6

OPERATION OF TRANSMISSION APPARATUS 2 (DIH) (DURING SAVING)

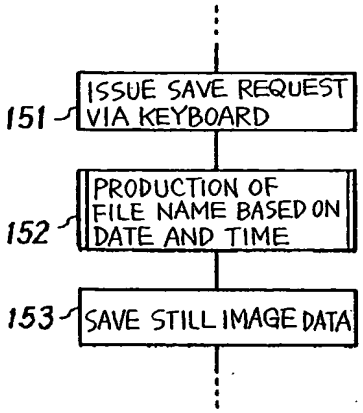


FIG. 7

FILE NAME PRODUCTION ROUTINE